Purchased Care - Program Integrity Enhancements (PC-PIE)

System Design Document



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Revision History

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| 10/23/2015 | 1.0 | Submit for VA approval |  |

Artifact Rationale

The System Design Document (SDD) is a dual-use document that provides the conceptual design as well as the as-built design. This document will be updated as the product is built, to reflect the as-built product.

When to Complete Each Section of the SDD

| Section | Completed On or Before PMAS Phase | Rationale |
| --- | --- | --- |
| 1 – Introduction | MS 0 Review; updated thereafter | Conceptual design should inform evaluation of investments |
| 2 - Background | MS 0 Review; updated thereafter | Conceptual design should inform evaluation of investments |
| 3 – Conceptual Design | MS 0 Review; updated thereafter | Conceptual design should inform evaluation of investments |
| 4 – System Architecture | MS 0 Review; updated thereafter | Conceptual design should inform evaluation of investments |
| 5 – Data Design | MS 1 Review; updated thereafter | Design details should be elaborated upon during PMAS Planning phase and prior to development |
| 6 – Detailed Design | MS 1 Review; updated thereafter | Design details should be elaborated upon during PMAS Planning phase and prior to development |
| 7 – External System Interface Design | MS 1 Review; updated thereafter | Design details should be elaborated upon during PMAS Planning phase and prior to development |
| 8 – Human Machine Interfaces | MS 1 Review; updated thereafter | Design details should be elaborated upon during PMAS Planning phase and prior to development |
| Attachments | MS 1 Review; updated thereafter | Design details should be elaborated upon during PMAS Planning phase and prior to development |

A product’s system design should be defined conceptually prior to the allocation of personnel and resources that occur at project initiation. This gives the enterprise an opportunity to evaluate IT investments before project teams are stood up and funding is allocated. Sections 1- 4, which discuss the high-level design, should be completed prior to MS 0. All sections should be completed and updated before MS 1. Projects will need to address all SDD approval constraints prior to the MS 2 review. In addition, the SDD should reflect the as-built product going into the MS 2 review.

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# Introduction

The Department of Veterans Affairs (VA), Veterans Health Administration (VHA), is one of the world’s largest health care delivery organizations. The VA Chief Business Office Purchased Care (CBOPC) Business Lines is the sole authority responsible for administration and payment of healthcare services provided to Veterans and eligible dependents outside of the VA healthcare system.

The Program Integrity Tools (PIT) system is a comprehensive set of tools to detect Fraud, Waste, and Abuse (FWA) for the CBPOC programs at the VA. This solution serves as a single national source to view Purchased Care Claims data, specifically providing systems integration to implement robust FWA toolsets to improve payment accuracy, centralized control of business rules, and FWA detection, as well as improved efficiency of processing, payment, or denial of health care claims submitted by non-VA providers. The system was built, tested, and deployed to the VA production environment in 2012, and has been addressing the claim scoring, centralization of claim data, and related reporting capability needs of the CBOPC programs. The existing solution architecture the Program Integrity Tools is comprised of four primary components:

* Program Integrity Data Repository (PITEDR)
* Claims Scoring Tool
* Reporting and analytics capability
* Data integration/Extract Transform Load (ETL) services that load claim data from source systems into the repository and posts claim scoring results for use in payments.

The CBOPC has established elements of a FWA program using the PIT through the Secretary’s Transformational Initiatives Program. This tool utilizes a set of custom business rules and logic capabilities to evaluate or "score" a claim based upon the likelihood of fraud or improper payment.

Known deficiencies in the current implementation include:

* Not all of the CBOPC programs are routed through the PIT, this includes parts of Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA), Spina Bifida (SB) and all of Foreign Medical Program (FMP) claims.
* Incomplete extract of adjudicated claims. Claims Processing and Enrollment (CP&E) system adjudicated claims are sent to the inbound PIT DropZone but are not being consumed or stored.
* CP&E data transfers to the PIT are not error free.

The PC-PIE project will expand the capabilities of the PIT system to allow for more comprehensive claim-auditing procedures by adding the following functionalities to the PIT:

1. Integrate CP&E as a source system with the PIT through ETL services to obtain the CP&E data directly from CP&E, which would provide daily updates from CP&E.
2. Enhance transfer management for exception handling and data integrity within the PIT repository to address the known deficiencies in the current implementation and to plan for future growth of the programs.

The purpose of this document is to describe how the current design and architecture of the PIT will change with the upcoming Purchased Care-Program Integrity Enhancements. It highlights these changes and provides contextual information on the system already tested, reviewed, and deployed to production.

This document is intended for technical users responsible for managing security, deploying rules, administering the database, performing other administrative tasks, etc., as well as for project management personnel responsible for ensuring the PIT fulfills project requirements.

## Scope

The scope of this project is focused on CP&E enhancements dealing with data transfer management and historical data loading along with FMP incorporation into the PIT. The scope of this project consists of the following CP&E enhancements:

* CP&E - the primary system that adjudicates Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA), Foreign Medical Program (FMP), and Spina Bifida (SB) claims.
* PIT - the primary system that enables CBOPC staff to perform data analysis in support of FWA prevention.
* Completion of a historical data load into the PIT, which will enable more robust data analysis and trend analysis.
* Transmission of all adjudicated claim data, to include historical data for six previous calendar years and all future data from CP&E.
* Utilization of all adjudicated claim data from the identified Purchased Care Programs in the PIT data repository.
* Monitoring of the progress of retrieving claims from the source systems to the PIT data repository, identifying all claim exceptions or processing errors, and communicating these to the Department of Program Integrity. Utilization of all resources currently used to monitor and report claim exception and processing errors in the DropZone for other business functions.

The complete scope of this project can be found in the [PC-PIE BRD](https://vaww.server1.domain/sites/cbopc/BSM/PIE/PL/Business%20Requirements%20Document%20for%20Purchased%20Care%20Program%20Integrity%20Enhancements%20(PC-PIE)%20-%20FINAL-%20ver1%208.pdf) and section 1.2 of the [PC-PIE RSD](https://vaww.server1.domain/sites/cbopc/BSM/PIE/PL/PC-PIE%20RSD%20v1.1.pdf).

## User Profiles

The Program Integrity Tools was designed with the following primary user groups in mind. Details of different roles have been confirmed with Program Integrity Tools stakeholders.

Table 1: PIT Primary User Groups

| Role | Responsibilities | Business Need from PIT | System Proficiency |
| --- | --- | --- | --- |
| VA Auditor Group | Running reports from the PITEDR based on VA OIG priorities | Coordination & assistance from PI Team | Data analysis tools |
| Program Integrity /Informatics team members | CBO Business Analysts responsible for addressing and reporting on FWA | Oversight and Reporting on FWA detection and prevention, as well as communication to Operations Manager | Multiple cube-based data analysis tools |
| AITC System Administrator | Manage configuration of the PIT software in all environments | Manage configuration of the PIT software in all environments |  |

The table below lists the different administrator roles of the Program Integrity Tools. Details of level of support for each role were determined in consultation with Program Integrity Tools stakeholders.

Table 2: PIT Administrator User Roles

|  |  |  |
| --- | --- | --- |
| Role | Tool | Description |
| Fraud and Abuse Management System (FAMS) Admin | FAMS web app  FAMS database  FAMS Administrative Utility | Maintenance of the system that includes maintaining reports, database commands, and sever jobs, as well as users. |
| JRules Architect | WebSphere ILOG JRules | Overall deployment organizations of rules and making sure that the execution of rule sets is optimized |
| WebSphere Business Events (WBE) Admin | IBM WebSphere Business Events | Administration of the WBE system management functions and generation of system reports |
| Database Administrator (DBA) | MS Structured Query Language (SQL) Server | Management of the data repository.  Works with the development teams to maintain consistent data structures. |
| InfoSphere Admin | IBM InfoSphere Data Stage | Management of the ETL script. Maintenance of the ETL jobs. |
| WebSphere Admin | IBM WebSphere | Administration of the WebSphere system management functions and generation of system reports |

# Background

The PIT currently receives Purchased Care claims data from Fee Basis Claims Software (FBCS) and from daily receipts of Electronic Data Interchange (EDI) batch files that are sent to CBOPC from Emdeon (X12-837 professional, Institutional, and dental) from Optum (formerly SXC) (NCPDP D.0 format) and the VA Mail Order Pharmacy warehouse in Leavenworth (NCPDP D.0 or similar format). These files contain raw EDI data prior to being scored or validated for eligibility. The PIT repository also accepts supporting claim data from the Corporate Data Warehouse (CDW). Files received from FBCS goes through a Data Transfer Management process that ensures all data files has been transmitted without data corruption. These files then go through the ETL process in order to be consumed by PIT. PIT scores each claim for the risk of FWA, and stores the claim data in the PITEDR to allow reporting against the claims data. FBCS is the primary system that adjudicates Non-VA Care claims, while CP&E consists of CHAMPVA, FMP, and SB claims. As part of this project, the CP&E post-payment claims are being incorporated into the PIT. The PC-PIE project will not be making any changes in the process for HAC Repository data transmission to the PIT. This project will not have any impact on FBCS or CDW. Any reference to FBCS or CDW is for background purposes.

## Overview of the System

The Program Integrity Tools comprises multiple components:

* The PIT data repository is being fed (from FBCS, CP&E X12, and NCPDP D.0) claims data through the DropZone.
* Supporting claim data from the Corporate Data Warehouse (CDW) is feed directly into the ETL.
* The Data Transfer Management process that alerts the DSS Help Desk when there is an error in transmission or data corruption for FBCS.
* The claims scoring tool assigns scores based on the risk of fraud, waste, and abuse on a pre-payment basis.
* Once the claims have been scored, the ETL pushes claim scores to the DropZone where the FBCS retrieves and processes them accordingly.

The following figure depicts the ‘As-Is’ overview of the Program Integrity Tools and its purpose.



Figure 1: Program Integrity Tools ‘As-Is’ System Overview

### ETL Process

The ETL process moves data in batch processes between the DropZone and the data repository for CP&E X12, the ETL utilizes an open-database connectivity link to directly integrate data into the Data Repository. InfoSphere Data Stage is the technology used for transforming and loading claims-related data into the Data Repository. Business rules for data transformation are established and managed in the Data Stage. The ETL jobs run as services to load claims-related data into the Data Repository operating environment.

The transformation process implements business rules that define data aggregations and the relationships between the various entities in the data.

The loading process inserts and commits the desired attribute into the target tables. The data repository collects data elements at the lowest details of the claim in order to present different levels of aggregation required by the scoring solution and the Business Intelligent reporting tools. Figure 2 shows the process flow for extracting, transforming and loading of all adjudicated claim data from CP&E to the central repository. For further details about the ETL process, refer to the [Non-VA Care Program Integrity Tools- CP&E ETL Design Document v.1.0](https://vaww.server1.domain/sites/cbopc/BSM/PIE/_layouts/WordViewer.aspx?id=%2Fsites%2Fcbopc%2FBSM%2FPIE%2FPL%2FNon%2DVA%20Care%20Program%20Integrity%20Tools%20%2D%20CP%5FE%2DX12%20and%20Data%20Warehouse%2DETL%20Design%20Document%20v1%2E4%2Edoc&source=https%3A%2F%2Fvaww%2Eserver1%2Eva%2Egov%2Fsites%2Fcbopc%2FBSM%2FPIE%2FPL%2FForms%2FAllItems%2Easpx%3F%26%26p%5FCategory%3DRequirements%2520Artifacts%26p%5FFileLeafRef%3DRED%2520Informational%2520Template%252edocx%26%26PageFirstRow%3D1%26%26View%3D%7B4DEE3D2C%2D15D1%2D4B7E%2D8B12%2DD4243993CAD9%7D).



Figure 2: ETL Process for CP&E Claims

### Data Transfer Management (Activity Log)

The ETL service captures all transactions from CP&E to the PIT repository into an activity log. This activity log is currently available for authorized users to generate reports auditing data transmission, identifying data errors, and other transmissions that utilize the ETL service. As part of this project, the table below lists the minimum data elements that will be available for query in order to generate these reports to assist in resolving all data transfer errors.

Table 3: Activity Log

| Fields | Description |
| --- | --- |
| Timestamp | Date and Time |
| Source system Identifier | Unique Identifier for the Source System |
| Connection attempts | # of times the ETL batch job |
| Connection success/failure | Indicates the whether the transaction was successful or unsuccessful |
| Number of records transferred | Indicated the number of records transferred in the file |
| Log Date | Date the Activity Log was created |
| Batch Number | ETL batch job number that ran the file |
| Data Repository Claim ID | PIT repository Claim ID |
| Data Received (Size) | Size of the data received |
| Number of Errors | Counts of errors in the data |
| Conformed Data Size | Size of data after being conformed (formatted) |
| Execution Status | Execution status of scheduled transformations |
| Transformations Issues | Issues with scheduled transformations |

The ability to query the ETL activity logs is one part of the data transfer management process that is to be put in place for this project. The second part of the data transfer management process is being able to receive notification of the transactions to resolve data transfer errors. There is currently a notification process in place for FBCS transactions. This project will apply a similar notification process to CP&E transactions. A daily automated activity log email will be generated containing the following data elements for the previous day’s extractions:

1. Size of data received
2. Quantity of data received
3. Counts of errors in the data
4. Size of data after being conformed
5. Execution status of scheduled transformations
6. Issues with scheduled transformations

This email is sent directly to the CP&E POC (point of contact). Using these details within the email, the CP&E POC will determine whether the transmissions have been completed successfully or have failed. In case of failure, the CP&E POC will resolve the issue and re-queue the file for processing. There are three different types of data transmission failure classification. Each will prompt a different level of response from the CP&E POC. The table below describes the recommended actions for each type of data transmission for the CP&E system.

Table 4: Data Transfer Management Transmission Types

| Transmission Types | Transmission Description | Key information included in message | Response |
| --- | --- | --- | --- |
| Successful Transmission | No errors occurred | Summary of record counts and data files. | None |
| Corrupt Data (Records) | Some of the data in the transmission file is corrupted, i.e. some records missing one or more fields, or not passing validation checks | Incident Date  Record IDs | Research record(s) and if valid record, re-queue them for inclusion in next file sent to the drop zone |
| Corrupt File | All of the Data in the transmission file is corrupt | Entire file was corrupted | Check server, reboot server/restart service as necessary, re-queue records for inclusion in next file sent to the drop zone |
| Transmission Failed | No transmission file was received | Incident Data File(s) not received | Check server, reboot server/restart service as necessary.  Check to see if file creation was initiated, check for records that may have been queued for transmission, re-queue records as necessary |

### Reporting and Dashboard

PIT provides access to data from across multiple source systems. The data model enables a report author to design and implement cross-functional reports to meet the information needs of business users and claim processing clerks. In addition, the data repository allows users to interrogate data and build ad-hoc reports and queries.

The Microsoft Business Intelligent (BI) has been selected by VA to be the toolset for building business intelligence and analytics for Program Integrity users. Microsoft BI provides the VA with the capability to develop reusable standard reports available to users on-demand or when run on a schedule. Users also have the ability to develop ad-hoc queries/reports where they have greater control over content and layout. Additionally, users have the ability to create metrics and filters. These tools include Report Builder, SQL Server Reporting Services (SSRS), SQL Server Management Studio (SSMS), SQL Server Integration Services (SSIS), Open Database Connectivity (ODBC) drivers, and Excel.

User access to reporting is based on his/her authorization level. This characterization distinguishes users primarily by their expected sophistication in the use of reporting applications. The design and complexity of reporting-application use depends on the role performed. Analysts, for example, are expected to typically be the most sophisticated users. This project will not have any impact on the existing reporting and dashboard system.

## Overview of the Business Process

The PIT receives Non-VA Care claims from providers and/or beneficiaries via paper, or electronically using EDI, and processed in the VA source systems. The current source systems for the PIT include the FBCS processing sites associated with the Purchased Care, as well as the CHAMPVA and Spina Bifida programs from the CP&E system. The PIT repository also accepts supporting claim data from CDW.

Claims are received daily from each of the source systems through the ETL service. The ETL service will load the claim data into the repository. Each claim is then scored for the risk of FWA through the claims scoring tools, JRules and FAMS. After the claim data is scored, the claim data and score is sent to the DropZone by the ETL service so the FBCS claim is picked up by the source system. Although the CP&E claims are scored within the PIT, these scores are not used in any claim or claim processing. These scored claims are used for audit purposes and are not returned to the source system.

As part of this project, the process will be enhanced to receive claims from CP&E and generate data transmission activity logs. The claim will then be extracted from CP&E and formatted, making it ready for submission to PIT. Validation and formatting rules are applied to the claim, as identified in the requirements. PIT will receive a properly formatted claim and prepare it for storage in the PIT repository. PIT will evaluate the information received to ensure that the file conforms to the expected mandatory data elements such as the correct dataset-id and claim-id. If a difference occurs, the control exception is logged for further processing. The VA source system will proceed to resolve issues in a manner that will allow the claim to be re-extracted in the next cycle. Once the claim is stored in PIT, the business-level personnel will be able to query and generate reports for the desired source system.



Figure 3: CP&E Business Process – ‘To-Be’

## Overview of the Significant Requirements

### Functional Requirements

All business and technical requirements, from initial requirements elicitation through the elaboration process, will be captured in a Requirements Traceability Matrix (RTM). A New Service Request (NSR) has been submitted that governs the scope of requirements listed in this document. Generally, the CBOPC refers to claim data regardless of the source of that data. Some claims arrive at the CBOPC via EDI, and some arrive on paper through the U.S. Post Office. Those paper claims are manually entered into CP&E. However, paper based claims are not sent to the PIT; only EDI claims are sent to the PIT but they are not consumed.

For this enhancement, the CBOPC requirements that address sending claim data to the PIT are defined to include both claims from EDI data and claims from paper submissions, so as to address this known deficiency. The functional business requirements identified in section 2.6 of the [PC-PIE RSD](https://vaww.server1.domain/sites/cbopc/BSM/PIE/PL/PC-PIE%20RSD%20v1.1.pdf) are based on business requirements specified in the [PC-PIE BRD](https://vaww.server1.domain/sites/cbopc/BSM/PIE/PL/Business%20Requirements%20Document%20for%20Purchased%20Care%20Program%20Integrity%20Enhancements%20(PC-PIE)%20-%20FINAL-%20ver1%208.pdf).

### Workload and Performance Requirements

The following table identifies the important performance and workload requirement that is currently in place. This project will not have any impact on existing system requirements.

* Reporting tool shall support a minimum of 100 simultaneous users performing write and read transactions during the estimated peak usage hours of 8 a.m.-10 p.m., EST (during weekdays).
* The operation of any single PIT component shall not affect the performance, availability, or speed of any other PIT components.

### Operational Requirements

The following list identifies the operational requirements that are currently in place and drive the system design. This project will not have any impact on existing system requirements. Monitoring and solution of agreed/identified critical systems are under IT support 24 x 7 x 365.

* PIT shall provide the capability to schedule large transaction functions during non-business hours.
* The ETL Tool shall be capable of performing its duties (extract/transform/load) within the periodic cycle established for synchronization with the external systems.
* Reporting Tool shall be available 99.99% of time from 6 a.m. EST, to 10 p.m. EST, Monday through Friday.
* The Scoring Tool shall be available 99.99% of the time, 24-hours per day, Monday through Friday. Holidays and weekends are excluded because no Veterans Integrated Service Network (VISN) is working overtime.
* The Repository shall be available 24-hours per day, Monday through Friday. Holidays and weekends may be excluded on a scheduled basis provided that no VISN is working weekends.

### Reliability Specifications

The following summarize requirements for Reliability Specifications that are currently in place. This project will not have any impact on existing system requirements.

* Availability is 99.9% during defined work hours of 6 a.m. EST, to 2 a.m. EST.
* System will fully recover from an outage within 1 business day.
* One-hundred percent (100%) continuous back-up data will be restored when outage is recovered.
* Maintenance periods are non- working hours after 10 p.m., EST, weekdays. All maintenance periods would come with a minimum of 72-hours advanced notice to all users.
* Real-time monitoring and solution of agreed/identified critical systems are under IT support 24 x 7 x 365.

### Security Specifications

The Federal Information Processing Standard 199 (FIPS-199), *Standards for Security Categorization of Federal Information and Information Systems*, defines the security categories, security objectives, and impact levels to which National Institute of Standards and Technology (NIST) Special Publication (SP) 800-60 Volume 1 Revision 1, maps information types. A FIPS 199 analysis was completed for PC-PIE with a determined security categorization of ***Moderate*** impact. PC-PIE would require the performance of a Risk Analysis to determine if the current security impact level of ***Moderate*** is adequate for PC-PIE, in addition to updating the System Security Plan (SSP), and documenting pertinent existing and planned security controls to fully reflect PC-PIE security requirements.

The tables in section 2.12 of the [PC-PIE RSD](https://vaww.server1.domain/sites/cbopc/BSM/PIE/PL/PC-PIE%20RSD%20v1.1.pdf) include the list of associated security controls and privacy controls for a ***Moderate*** security categorization based on NIST Special Publication 800-53 Rev.4, VA Directive 6500, and VA Handbook 6500, published March 2015**.**

# Conceptual Design

This section of the SDD provides details about the following topics:

* Conceptual Application Design
* Conceptual Data Design
* Conceptual Infrastructure Design

## Conceptual Application Design

Conceptual application design offers an overview of core functional components for the PC-PIE project without itemizing specific design characteristics or physical architecture. This is focused on logical design and what components and subcomponent of logical functionality are required, to meet all PC-PIE requirements and gain user acceptance.

### Application Context

The new enhancements address this issue by allowing the transmission and utilization of all adjudicated claim data from the identified Purchased Care Programs into the PIT data repository. The Data Transfer Management system will be monitoring the progress of retrieving claims from the CP&E to the PIT data repository, identifying all claim exceptions or processing errors, and communicating these to the Program Integrity Department. Section 2.1.2 addresses the different classifications of transmissions that can be triggered and how they will be handled. There will also be proactive monitoring and identification of exception and processing errors using the query and reporting capability within ETL. This will allow all CP&E data to be consumed, as well as identify which files are not being received.

The figure below shows the location of relevant environments and the interfaces associated with PIT. These include the PIT, the DropZone, CP&E, and their locations from a logical perspective.



Figure 4: Application Context Diagram

Table 5 describes the entity information shown in the Application Context Diagram.

Table 5: Application Context Description

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object ID | Name | Description | Interface | Interface System |
| 1 | CP&E | Cache based Claims Processing and Enrollment system for handling of CHAMPVA, Spina Bifida and Foreign Medical Program claims. | DropZone (ANSI X12 format) | CP&E  DropZone |
| 2 | DropZone | Data exchange | Flat file | CP&E  ETL |
| 3 | ETL | Moves data in batch processes between the DropZone and the data repository | ODBC | DropZone  PIT Repository |
| 4 | Data Transfer Management | Activity log email and Activity log reports | ETL | PIT Data Repository |
| 5 | PIT Data Repository | Enterprise repository to store claim data extracted from VA claim processing systems. | ODBC | ETL |
| 6 | CP&E POC | Point of contact that will receive alerts from the Data Transfer Management | Window FileShare Server | CP&E |
| 7 | Reporting | Microsoft BI Reporting Tools | HTTP/GUI | Microsoft Report Builder  PIT |

### High-Level Application Design

The High-Level Application Design identifies the major components of the PIT solution and the relationships of the application components to each other and to the surrounding applications. The fundamental design of the PIT will remain unchanged as a result of the PC-PIE enhancements.

The figure below provides a high-level illustration of the CP&E Application Design.



Figure 6: High-Level Application Design

The enhancements will require modification or development of the following:

* Creation of ETL batch job to transmit CP&E historical data flat files in a manageable size, containing CP&E adjudicated claim data. These files will need to be created and dated back from the prior six years to allow historical data from CP&E and uploaded into the PIT.
* Creation of new ETL job to transmit FMP claim data flat file to be uploaded into the PIT.
* Modification of the ETL job used to transmit CHAMPVA and SB claim data flat file to extract the additional fields needed to be uploaded into the PIT.
* Modification of the CHAMPVA and SB claim data flat file to add the additional fields.
* Addition of CP&E claim processing logs in the ETL to resolve data transfer errors.
* Creation of CP&E process that will send an email message to the CP&E POC when a file is corrupt, data is corrupted, transmission of the file fails, or transmission was successful.

The table below describes the entity information shown in the High-Level Application Design shown in figure 6.

Table 6: PIT High-Level Application Design Steps

| Step | Details |
| --- | --- |
| 1 | CP&E provide claims data to the DropZone in flat-file format. |
| 2 | DropZone retains the file until batch job is executed from the ETL to retrieve the data. |
| 3 | The Data Transfers Management process verifies the successful transmission of the file. |
| 4 | Actions are taken if there is failure in the transmission. |
| 5 | ETL processes claim data from the DropZone and loads it into the PIT Data Repository. |
| 6 | PIT Data Repository integrates and standardizes claim data to allow for a comprehensive view. |

### Application Locations

The Program Integrity Tools components have been deployed in a central location that can be accessed from anywhere within the VA network. The Program Integrity Tools suite is hosted at AITC.

Table 7: Application Locations

| Application Component | Description | Location at Which Component is Run | Type |
| --- | --- | --- | --- |
| Scoring Tool | Pre-payment FWA scoring tool | AITC | Business Logic / Data Logic / Interface Code |
| ETL Tool | Extraction, Transformation and Loading of Claims data to Central Repository | AITC | Business Logic / Data Logic / Interface Code |
| Data Repository | Central data repository | AITC | Data Logic |
| Reporting Tools | Dashboard and reporting Tools including Report Builder, SSRS, SSMS, SSIS, ODBC drivers | AITC | Presentation Logic |

The following table lists the Program Integrity Tools users.

Table 8: Application Users

| Application Component | Location | User |
| --- | --- | --- |
| Scoring Tool | AITC | For the scored Claims, the CBO Claims Clerk is an Operational Customer. For managing the business rules, the following roles apply: Business Rule Analyst  FAMS: Profiling (to build models and profiles)  ILOG JRules (to define the vocabulary, write and organize business logic into business rules and inspect execution traces)  Business Rule Developer  FAMS: Value Set Generation User (to setup the data load required for profiling)  ILOG JRules (implementation for the business rule vocabulary, debug and tune rule execution) |
| ETL Tool | AITC | Power Users (currently IBM) to maintain and update ETL routines |
| Data Repository | AITC | Power Users to maintain, update, extract data requests |
| Reporting Tool | Throughout VA | Business Owner as Management Customer:  General: Will run some standard reports on an ad hoc basis. They will not be required to build new reports and are consumers of standard reports.  Analyst: Detailed information requirements; may include segments of data corresponding to business transactions based on a period of time. Builds new reports to meet information needs and typically possesses a good understanding and knowledge of where the data resides and how the data is structured.  Management: Consumes summarized information at intermediate level across business entities. Will have limited analytics and drill-down capabilities.  Executive: Consumes highly summarized information (Dashboard) with limited/causal drill-down capabilities and will focus on trend analysis for predefined business entities over a long period of time. |

## Conceptual Data Design

### Project Conceptual Data Model

The conceptual data model describes entities of significance to the VA PIT and Informatics organization. These data entities link to each other and to other external entities within the context of the PIT data repository. The foundation of the PIT conceptual model is a multidimensional schema consisting of dimension entities and fact entities. Dimension entities are sets of related attributes that contain the textual descriptors of the business and are used to group facts-based information. The fact entities consist of the measures PIT is interested in capturing. Both dimensions and facts group together in what is called a star schema model. The PIT conceptual model consists of collections of star schemas aligned to multiple fact tables and conforming dimensions related to the claim raw information and FAMS claims and provider scores. Each set of star schemas correspond to a subject area in the conceptual data model. The PIT conceptual model consists of the following subject areas:

* Dental Claims
* Pharmacy Claims
* Institutional Medical Claims
* Professional Medical Claims
* Claim line Scores
* Provider Risk Scores
* Lookup/reference values

Please refer to the [Project Information Folder](https://vaww.server1.domain/sites/cbopc/BSM/PIE/PL/Forms/Requirements%20Artifacts.aspx) for the diagrams of the current data models. FMP claims, as well as the other program claims portions of the data model, will be impacted by the enhancements within this project. The majority of the models will contain the same tables with the addition of a few unique tables. The development team will add the additional tables during their agile sprints.

### Database Information

The database infrastructure will consist of several physical databases to handle the persistent layer of the PIT Set.

Table 9: Physical Databases and Related Details for Production Environment

| Database short name | Database long name | Purpose | Location | DB server | Data Storage Path |
| --- | --- | --- | --- | --- | --- |
| PITEDR | Program Integrity Tool Enterprise Data Repository database | Enterprise repository to store claim data extracted from VA claim processing systems. | AITC |  | E:\ |
| PITEDR\_PRESTAGE | Program Integrity Tool Enterprise Data Repository Pre-Staging database | To pre-stage data before being processed by ETL tool | AITC |  | E:\ |

Below are the specifications for the servers used by the Program Integrity Tools:

Table 10: Server Environment Specifications

| Type & Function | Environment | Hostname | OS & Software |
| --- | --- | --- | --- |
| MS SQL Database Server | DEV  TEST |  | Windows 2008 Server 64-bit  MS SQL SERVER 2008 |
| PRE-PRD  PRD |  |
| DataStage Application Server #1 | DEV  TEST |  | Windows 2008 Server 64-bit  InfoSphere Information Server 8.7 |
| PRE-PRD  PRD |  |
| DataStage Application Server #2 | DEV  TEST |  | Windows 2008 Server 64-bit  InfoSphere Information Server 8.7 |
| PRE-PRD  PRD |  |

### User Interface Data Mapping

This section describes and defines the format and information that will be available for users of the product to be able to map and retrieve information from the database, if applicable. The existing screen will not be modified as part of this project.

#### Application Screen Interface

There will be no Graphical User Interface enhancements for this project.

#### Application Report Interface

There will be no reporting template development for this project.

#### Unmapped Data Element

All FMP tables will need to be added and mapped because they are not part of the current interface with PIT. Figure 6 displays all FMP tables.

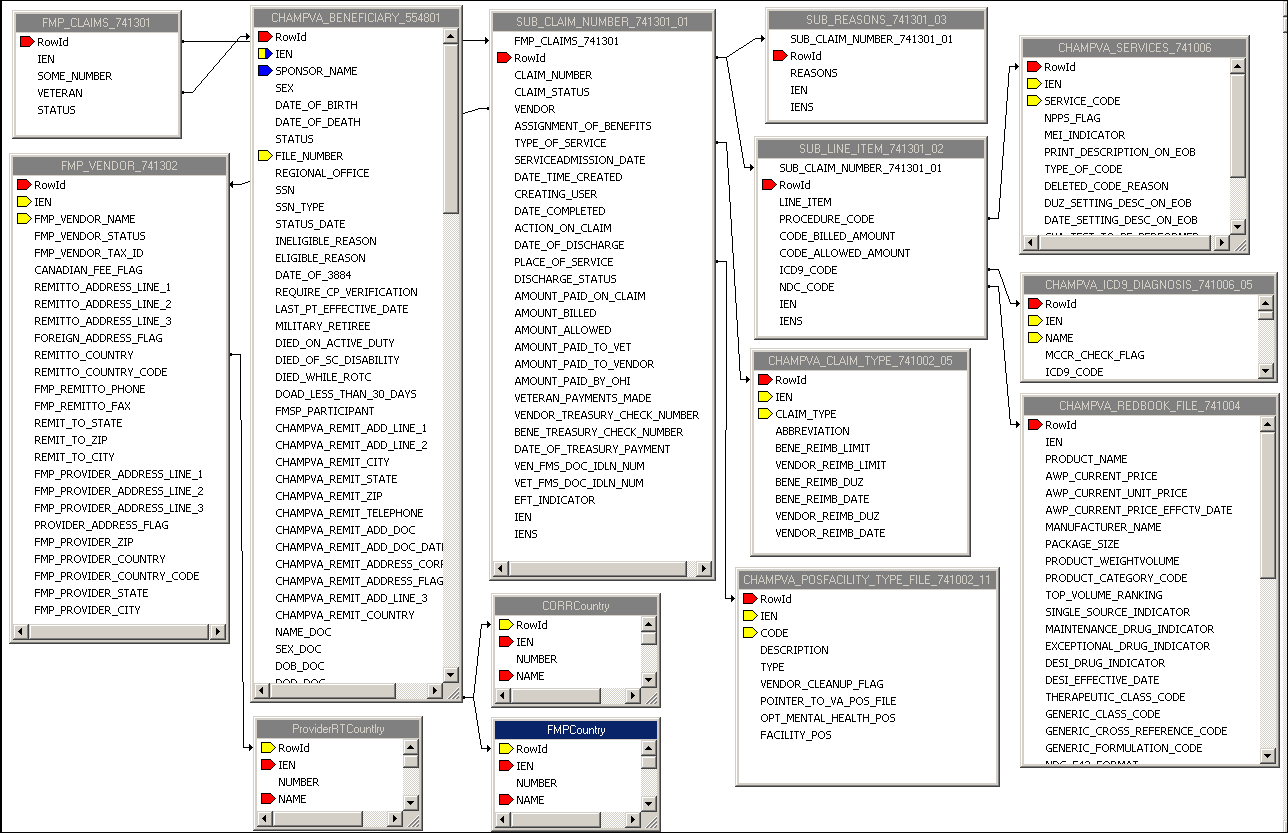


Figure 6: FMP Unmapped Data Elements

## Conceptual Infrastructure Design

This section describes a very high-level overview of the conceptual infrastructure of the production environment, which has already been deployed as part of the original increment and will remain unchanged.

### System Criticality and High Availability

PIT will ensure high availability by adhering to general design guidelines. There will be no impact to system criticality and high availability during this project.

### Special Technology

During this project, there will be no new special technology introduced into the system.

### Technology Locations

Table 11: Technology Locations

| System Name | Location | Interface Methods |
| --- | --- | --- |
| FAMS | AITC | Java Database Connectivity (JDBC) |
| MS Business Intelligence | AITC | .Net/Open Database Connectivity (ODBC) |
| CP&E | CBOPC | File Transfer |
| InfoSphere Data Stage | AITC | JDBC |
| CDW | AITC | ODBC |

### Conceptual Infrastructure Diagram

This project will not have any impact on infrastructure of the PIT.

#### Conceptual Production String Diagram

This project will not have any impact on the production string of the PIT.

# System Architecture

The following figure depicts the overview of the Program Integrity Tools architecture. The existing system architecture will remain the same for this project. However, an addition to the system architecture will include exception handling of claims data that does not meet the data validation requirements. The new addition is highlighted in yellow in the diagram below.



Figure 7: VA PIT Architecture Overview

## Hardware Architecture

The PIT Production environment is the go-live environment, spanning multiple VISNs and including genuine claims coming from FBCS, CP&E, and CDW. No additional hardware will be procured during this project.

Table 12: PIT Production Environment Configurations

| Server | Location | Purpose | CPU | RAM  GB | OS  GB | APP  GB |
| --- | --- | --- | --- | --- | --- | --- |
|  | AITC | SharePoint / BI Application Server | 4 | 16 | 40 | 80 |
|  | AITC | Database | 4 | 32 | 40 | 500 |
|  | AITC | Database | 4 | 32 | 40 | 500 |
|  | AITC | Rules App Server | 4 | 16 | 40 | 50 |
|  | AITC | Rules App Server | 4 | 16 | 40 | 50 |
|  | AITC | DataStage Application Server | 4 | 16 | 40 | 200 |
|  | AITC | DataStage Application Server | 4 | 16 | 40 | 200 |
|  | AITC | FAMS Application Server | 4 | 16 | 40 | 500 |

## Software Architecture

The existing PIT software architecture will continue to be utilized. The enhancements defined for this release are compatible with the existing software. Each component of the software has its published document. For details on the components, please reference the following documents:

* [*Non-VA Care Program Integrity Tools - Enterprise Data Architecture*](https://vaww.server1.domain/sites/cbopc/BSM/PITOM/_layouts/WordViewer.aspx?id=%2Fsites%2Fcbopc%2FBSM%2FPITOM%2FPL%2FNon%2DVA%20Care%20Program%20Integrity%20Tools%20%2D%20Enterprise%20Data%20Architecture%20%2D%20v1%2E7%2Edoc&source=https%3A%2F%2Fvaww%2Eserver1%2Eva%2Egov%2Fsites%2Fcbopc%2FBSM%2FPITOM%2FPL%2FForms%2FAllItems%2Easpx%3F%26%26p%5FCategory%3DProject%2520Information%26p%5FFileLeafRef%3DNon%252dVA%2520Care%2520Program%2520Integrity%2520Tools%2520%252d%2520System%2520Architecture%2520Design%2520for%2520AITC%2520%252d%2520v1%252e6%252edoc%26%26PageFirstRow%3D1%26%26View%3D%7BBBCF6F23%2D3BB9%2D46AF%2DB27B%2DBD4137381755%7D)
* [*Non-VA Care Program Integrity Tools - CP&E ETL Design Document*](https://vaww.server1.domain/sites/cbopc/BSM/PIE/_layouts/WordViewer.aspx?id=%2Fsites%2Fcbopc%2FBSM%2FPIE%2FPL%2FNon%2DVA%20Care%20Program%20Integrity%20Tools%20%2D%20CP%5FE%2DX12%20and%20Data%20Warehouse%2DETL%20Design%20Document%20v1%2E4%2Edoc&source=https%3A%2F%2Fvaww%2Eserver1%2Eva%2Egov%2Fsites%2Fcbopc%2FBSM%2FPIE%2FPL%2FForms%2FAllItems%2Easpx%3F%26%26p%5FCategory%3DRequirements%2520Artifacts%26p%5FFileLeafRef%3DRED%2520Informational%2520Template%252edocx%26%26PageFirstRow%3D1%26%26View%3D%7B4DEE3D2C%2D15D1%2D4B7E%2D8B12%2DD4243993CAD9%7D)
* [*Non-VA Care Program Integrity Tools - Repository User Guide*](https://vaww.server1.domain/sites/cbopc/BSM/PIE/_layouts/WordViewer.aspx?id=%2Fsites%2Fcbopc%2FBSM%2FPIE%2FPL%2FNon%2DVA%20Care%20PIT%2D%20Repository%20User%20Guide%20%2D%20v1%2E5%2Edocx&source=https%3A%2F%2Fvaww%2Eserver1%2Eva%2Egov%2Fsites%2Fcbopc%2FBSM%2FPIE%2FPL%2FForms%2FAllItems%2Easpx)

## Network Architecture

The existing PIT network architecture will continue to be utilized. The enhancements defined for this release are compatible with the existing software. The following table depicts the network infrastructure for PIT.

Table 13: PIT Network Infrastructure

| Component | Default Port Numbers |
| --- | --- |
| IBM Information Server Web-based clients |  |
| IBM Information Server Web-based clients - HTTPS |  |
| WebSphere Application Server Administrative console |  |
| WebSphere Application Server Administrative console (HTTPS) |  |
| IBM Information Server services (RMI/IIOP) |  |
| IBM WebSphere Information Services Director services with JMS bindings |  |
| SQL Server database |  |
| IBM Information Server ASB agent |  |
| IBM Information Server logging agent |  |
| IBM WebSphere DataStage and QualityStage services |  |
| Parallel job monitors |  |
| Parallel engine (APT\_PM\_STARTUP\_PORT) |  |
| Parallel engine remote process startup (rsh/ssh, multiple nodes only) |  |
| Parallel engine (APT\_PLAYER\_CONNECTION\_PORT, multiple nodes only) |  |

## Service Oriented Architecture / ESS

Service Oriented Architecture is not being utilized by the existing PIT system.

## Enterprise Architecture

The adherence to the Technical Reference Manual (TRM) and Standards Profile (SP) will be followed and described in more details when all the technology components for this project are selected. PIT will promote interoperability, portability, adaptability within systems, quality assurance and will utilize current technology to provide a framework for IT application and infrastructure development.

System components used by PIT, along with the component’s TRM status, are listed below.

Table 14: TRM Status

| Name | Version | TRM Status | TRM Link | Recommendations |
| --- | --- | --- | --- | --- |
| WebSphere Decision Server | 7.5.0.1 | Divest | [WebSphere Decision Server](http://trm.oit.domain/ToolPage.asp?tid=5803) | There is a separate project initiative under PIT that will update all of the IBM software effective September 28. |
| JRules | 7.5 | Divest | [JRules](http://trm.oit.domain/ToolPage.asp?tid=5803) | There is a separate project initiative under PIT that will update all of the IBM software effective September 28. |
| FAMS | 8.0 |  |  | This application will be upgraded to 8.2.1 |
| Microsoft SQL Server 2008 R2 Report Builder 3.0 |  | Unapproved | [Microsoft SQL Server 2008 R2 Report Builder 3.0](http://trm.oit.domain/ToolPage.asp?tid=5020) | The project plans to work with the AITC to upgrade the server to Microsoft SQL 2012. The estimated timeframe is March 2016. |
| Crystal Reports 2013 |  | Approved with Constraints | [Crystal Reports 2013](http://trm.oit.domain/ToolPage.asp?tid=5597) | Application would be tested for 508 compliance as part of the Operations and Maintenance (O&M) contract. |
| TOAD for Data Analyst | 3.1.0.638 | Divest | [TOAD for Data Analyst](http://trm.oit.domain/ToolPage.asp?tid=6381) | Application would be tested for 508 compliance as part of the O&M contract.  Also, this tool is no longer an approved tool by VA standard; we would recommend that a new tool be available for use. |
| Microsoft Excel 2010 | 2010 | Approved with Constraints | [Microsoft Excel 2010](http://trm.oit.domain/ToolPage.asp?tid=5612) | Application would be tested for 508 compliance as part of the O&M contract. |
| InfoSphere DataStage |  | Approved with Constraints | [InfoSphere DataStage](http://trm.oit.domain/ToolPage.asp?tid=6398) | There is a separate project initiative under PIT that will update all of the IBM software effective September 28. |

# Data Design

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

## DBMS Files

The following fields will need to be added for post-payment claims in the PIT

### Add CP&E Files

#### ADD Beneficiary Files

Table 15: CP&E Beneficiary File

| Field Name | Type | Length | Comment |
| --- | --- | --- | --- |
| DFN-BFN | Text | 15 |  |
| BENEFICIARY NAME | Text | 120 | Last name, first name, middle name string |
| BENE SSN | Text | 9 | No dashes, may have leading “0” |
| STATUS | Text | 40 | ELIGIBLE-ACTIVE; INELIGIBLE; PENDING REVIEW; PENDING DEERS ACCEPTANCE |
| IN RSN | Text | 4 | Code to describe reason for ineligible |
| ELIG RSN | Text | 4 | Code to describe reason for eligible |
| SEX | Text | 6 | MALE; FEMALE |
| DOB | Date | 10 | MM/DD/YYYY |
| DOD | Date | 10 | MM/DD/YYYY |
| ADD FLAG | Text | 14 | YES, WRONG ADDRESS |
| ADD 1 | Text | 50 | Address Line 1 |
| ADD 2 | Text | 50 | Address Line 2 |
| CITY | Text | 50 |  |
| ST | Text | 3 | State code number to cross table lookup |
| ZIP | Text |  | Zip code (5 or 9 digits) |
| PHONE # | Text | 20 | Phone with extension |
| HICN | Text | 11 | Medicare HICN |
| NAME | Text | 25 |  |

#### ADD Claim File

Table 16: CP&E Claim File

| **Field Name** | **Type** | **Length** | **Comment** |
| --- | --- | --- | --- |
| Claim RowID | Text | 10 | Unique identifier of a claim |
| Claim Number | Text | 7 | Unique identifier used on screens and print |
| DFN|BFN | Text | 15 |  |
| Vendor ID | Text | 10 |  |
| Created Date | Date | 10 | Date that Claim RowID was generated |
| Complete Date | Date | 10 | Date Claim went into Final Status |
| DOS | Date | 10 | Date of Service |
| Discharge Date | Date | 10 | Discharge date for inpatient episode of care |
| DRG | Text | 4 | Medicare DRG code, present when IPT claim is paid by DRG |
| Claim Type | Text | 1 | Values 1-6: 1=IPT; 2=OPTD; 3=RXT;4=DEM; 5=DNT; 6=TRV |
| Status | Text | 20 | Completed; Rejected; In Progress; Pay Requested; Admin Hold; Deleted |
| TOB | Text | 3 | Type of Bill |
| POS | Text | 3 | Place of Service; points to a look-up table |
| Billed | Currency | 13 | To billed charges for all line items on the claim |
| Allowed | Currency | 13 | Total allowed amount on claim |
| OHI Paid | Currency | 13 | Total payment + write off by primary insurance(s) |
| OHI PR | Currency | 13 | Patient responsibility remaining after OHI payment |
| HAC Paid | Currency | 13 | Amount paid by the VA |
| Cost\_Share | Currency | 13 | Amount applied to beneficiary annual cost share |
| Deductible | Currency | 13 | Amount applied to beneficiary annual catastrophic cap |
| REJ | Text | 4 | Code to describe claim rejection reason-requires cross table |
| ASG BEN | Text | 3 | Yes = Pay Provider; No= Pay bene |
| PCN | Text | 25 | Patient Control Number (block 3a on UB-04, block 26 on CMS-1500) |

#### ADD OHI File

Table 17: CP&E OHI File

| **Field Name** | **Type** | **Length** | **Comment** |
| --- | --- | --- | --- |
| DFN|BFN | Text | 15 |  |
| OHI Type | Text | 20 | Short Description, one of 24 possible OHI types |
| OHI Start | Date | 10 |  |
| OHI End | Date | 10 | Null Entry indicates this is the person’s current OHI coverage |

#### ADD Diagnosis Code VHA OPT RA File

Table 18: CP&E Diagnosis Code VHA OPT File

| **Field Name** | **Type** | **Length** | **Comment** |
| --- | --- | --- | --- |
| Claim RowID | Text | 10 |  |
| Diag Line ID | Text | 15 | Claim RowID combination with Diagnosis row number (Ex. 11111111|4, meaning 4th diagnosis on the reference claim row ID |
| ICD9\_Code | Text | 7 |  |

#### ADD Procedure File

Table 19: CP&E Procedure File

| **Field Name** | **Type** | **Length** | **Comment** |
| --- | --- | --- | --- |
| Claim RowID | Text | 10 |  |
| Service Code | Text | 5 | 5 digit CPT or HCPCS code |
| Billed | Currency | 13 |  |
| Allowed | Currency | 13 |  |
| Modifier | Text | 3 | Pointer to cross reference table that contains standard two digit modifier coder |

#### ADD Vendor File

Table 20: CP&E Vendor File

| **Field Name** | **Type** | **Length** | **Comment** |
| --- | --- | --- | --- |
| Vendor RowID | Text | 10 | Unique row in vendor file |
| PL\_Name | Text | 25 | (PL=Physical location or Service Facility Location) |
| PL\_Add LN 1 | Text | 25 |  |
| PL\_Add LN 2 | Text | 25 |  |
| PL\_City | Text | 25 |  |
| PL\_State Code | Text | 2 |  |
| PL\_Zip | Text | 9 |  |
| PL\_Phone | Text | 10 |  |
| RT\_Name | Text | 25 | (RT = Remit To or Billing) |
| RT\_Add LN 1 | Text | 25 |  |
| RT \_Add LN 2 | Text | 25 |  |
| RT \_City | Text | 25 |  |
| RT \_State Code | Text | 2 |  |
| RT \_Zip | Text | 9 |  |
| RT\_Phone | Text | 10 |  |
| Tax ID | Text | 9 |  |
| Add Code | Text | 2 | Extension to Tax ID to describe a geographic sub location |
| IM | Text | 2 | Internal Modifier – Used by CP&E staff to further describe a 9 or 11 digit tax ID grouping |
| FAC Type | Text | 2 | Pointer to a cross table that contains description |
| Specialty | Text | 3 | Pointer to a cross table that contains description |
| Status\_of\_Vendor | Text | 8 | “Active” or “Inactive” |
| Non\_PPS\_Flag | Text |  | Indicates if facility is exempted from Medicare payment rates |

#### ADD Pharmacy File

Table 21: CP&E Pharmacy File

| **Field Name** | **Type** | **Length** | **Comment** |
| --- | --- | --- | --- |
| Vendor RowID | Text | 10 |  |
| NDC | Text | 13 | 11 digit National Drug Code (Ex. 00000-0000-00) |
| Billed | Currency | 13 |  |
| Allowed | Currency | 13 |  |
| Quantity | Integer | 8 |  |

### Add FMP Files

The FMP data structure for CHAMPVA will need to have a flat file, ETL batch job and automated email alerts created. The file data instruction can be found in [Section 3.2.3.11 Unmapped Data Element](#_Unmapped_Data_Element). Noted below is some additional information regarding the tables.

#### FMP Vendor Table

There are no TaxIDs or NPIs associated with any of the FMP Vendors. So a Vendor Data match is going to be done manually at first, then a cross-reference Vendor ID table can be used.

#### CHAMPVA Beneficiary table

This table actually stores the information for the CHAMPVA Sponsors, who are not eligible for CHAMPVA program. But these Veterans ARE eligible for the FMP program, and this is the table that is used for that.

#### FMP\_Claims\_741301 table

This is the connecting Table to relate FMP Claim numbers to the Veterans. All other information is stored in the next table.

#### Sub\_Claim\_Number\_741301\_01 table

This is a main table used to hold most of the FMP Claims Related data, and all other tables are connected to this table via numerous Foreign Keys/Pointers.

#### Sub\_Line\_Item\_741301\_02 table:

This table holds all the line level information foreign keys for each claim. DX codes, Procedure codes and NDC codes are all pointers to the 3 tables that hold those specific values. (Champva\_Services\_741006: table of all the CPT, HCPCS and ICD 9 Procedure codes; Champva\_ICD9\_Diagnosis\_741006\_05 table: holds all the ICD9 and ICD 10 Diagnosis codes; Champva\_Redbook\_File\_741004 table: Holds all the NDC code information.)

Non-DBMS Files

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

## Data View

The following table is an example of the FMP program data.

Table 22: FMP Program Data View

| Field Name | Field Description | Notes: |
| --- | --- | --- |
| SPONSOR\_NAME | Veteran Name |  |
| SSN | Veteran SSN |  |
| BeneCountry | Veteran Remit to Country |  |
| CLAIM \_STATUS | Claim Status |  |
| VENDOR\_NAME | Vendor Name |  |
| VENDOR\_TAX\_ID | Vendor\_Tax\_ID | Internal Tax ID, not a true Tax ID |
| VendorCountryName | Veteran Remit to Country |  |
| FMP\_VENDOR\_ID | Internal Vendor ID |  |
| ASSIGNMENT\_OF\_BENEFITS | Assignment of Benefits | Is the claim from Vendor or Veteran |
| CLAIM\_TYPE | Type of Claim | Outpatient;Inpatient;Travel;DME;Phamarcy;Dental |
| POSFACILITY\_TYPE | Place of Service | Doctor’s Office or Patient’s Home |
| DOS | Date of Service |  |
| AMOUNT\_PAID\_ON\_CLAIM | Amount VA will pay on the claim |  |
| AMOUNT\_BILLED | Total Amount Billed |  |
| SERVICE\_CODE | CPT;HCPCS;ICD9 proc codes |  |
| ICD9\_CODE | Diagnosis Code | The preference would be to use ICD-10; if it is available within the FMP system |
| NDC\_CODE | NDC codes |  |
| PRODUCT\_NAME | Drug Name |  |
| LINE\_ITEM | Line Level counter |  |
| REASONS | Reject Reason |  |
| AMOUNT\_PAID\_TO\_VET | Amount VA Paid to Veteran |  |
| AMOUNT\_PAID\_TO\_VENDOR | Amount VA Paid to Veteran |  |
| DATE\_OF\_DISCHARGE | For Inpatient Only |  |
| DISCHARGE\_STATUS | For Inpatient Only |  |
| AMOUNT\_ALLOWED | Amount allowed for the Claim |  |
| AMOUNT\_PAID\_BY\_OHI | Amount paid by other health insurance |  |
| VENDOR\_TEASURY\_CHECK\_NUMBER | Vendor Check number if paid to Vendor |  |
| BENE\_TEASURY\_CHECK\_NUMBER | Veteran Check number if paid to Veteran |  |
| ClaimCreated | Date Claim was Created |  |
| CLAIM\_NUMBER | Internal Claim Number |  |

FMP also has issues related to TRICARE. TRICARE data is available in two layouts: three dimensional data or two dimensional data.

Table 23: FMP Data Related to TRICARE

| Issue | Description |
| --- | --- |
| DOS after DOD | Date of Service after Date of Death |
| Duplicate Claims | Between VA FMP and Tricare FMP |
| Geographical Improbability | Claims from USA and other countries on the same DOS |
| Eligibility Issues | Should Vets have both - Tricare and CHAMPVA coverage? |
| Vendor validation | Cross-Agency Vendor file match. Address match, Past behavior match. |

# Detailed Design

This section describes the proposed design in detail. This detailed design is based upon the conceptual design (high level) that was described in the document up to this point.

## Hardware Detailed Design

The core hardware design will not be modified or amplified for this PC-PIE effort. However, additional database storage space has been planned to continue the proper sustainment of PIT’s Production and Pre-Production servers. An additional 400GB is expected to be added to the system around the end of current year 2015, or early year 2016.

As of mid-September 2015, the PIT Data Repository requires ~2.771 TB of storage space. With the addition of the data feeds to be integrated in this Enhancement effort (on top of the existing FBCS and CP&E EDI nightly feeds), we anticipate that the repository will grow by ~20 GB/month moving forward. Therefore, the future expansion of PIT is anticipated into the FY16, which will require the purchase of another server for a mirror account that will be a copy of production.

This additional server will be utilized for reporting purposes.

## Software Detailed Design

The Claim Scoring Tool, PIT repository, ETL tool, and Reporting tool will need to be updated for this increment. The details for this section will be updated when the software developer has been identified and has begun development agile sprint cycles.

### Conceptual Design

This section introduces the conceptual information that establishes the basis for how the software will be built.

#### Product Perspective

The PC-PIE Project involves multiple applications with requirements to integrate new functionality into specific areas of the software. This project includes changes to existing PIT functionality related to DataStage, Reporting, and Scoring applications. Some of the changes are enhancements to existing system processes, while others are additions based on the current business processes.

##### User Interfaces

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Hardware Interfaces

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Software Interfaces

Table 24: PIT Software Interfaces

| Name | Min. Version Required | Version | Interface Method |
| --- | --- | --- | --- |
| WebSphere Decision Server | 7.5.0.1 | To generate the score decision based on the claims data and business rules defined in the repository | JBDC |
| MS Business Intelligence Report Builder | 3.0 | Allow business owner to monitor the Claim processing indicator stored in the central Repository. | .Net/ODBC |
| InfoSphere DataStage |  | Extract, transform and load the source data from the DropZone into the repository. And load the claims score from the repository to the DropZone. | JDBC |
| FBCS | N/A |  | File Transfer |
| CP&E | N/A |  | File Transfer |
| CDW | N/A |  | ODBC |

##### Communications Interfaces

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Memory Constraints

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Special Operations

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

#### Product Features

The Purchased Care-Program Integrity Tools Enhancements (PC-PIE) work will expand the capabilities of the PIT system to allow for more comprehensive claim auditing procedures by adding the following functionalities to PIT:

* Integrating CP&E as a source system with PIT. Completing the integration with CP&E will allow the flow of all adjudicated claims data from the CP&E system that support Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA), Spina Bifida (SB), and Foreign Medical Program (FMP) programs into the PIT data repository.
* Transfer management for exception handling and data integrity within the PIT repository. The enhancement of exception handling capability will enable CBOPC staff to proactively monitor the progress of transferring claims data from the source systems to the PIT data repository, identifying all claim exceptions or processing errors, and communicating these to the Program Integrity Department business owners so errors during the data retrieval and associated processing errors can be corrected in a timely manner by CBOPC staff.

#### User Characteristics

The following tables list the identified Program Integrity Tools based on user roles:

Table 25: Microsoft Business Intelligence Reporting Tool User Roles and Privileges

| Role | Privileges |
| --- | --- |
| Administrator | Sets access to group reports/objects for Power User |
| Report Author | Creates standard/ad-hoc reports for PIT, creates/modifies business rules in partnership with Chief of Program Integrity |
| Information User | Views and utilizes existing reports in Business Intelligence Tool |

Table 26: DataStage User Roles and Privileges

| Role | Privileges |
| --- | --- |
| Administrator | Manages environments and version releases, maintains data integrity, and assists developer with designing ETL processes.  Can create new data structures  Can execute system reports for capacity, performance, etc. |
| ETL Developer | Formulates data models, creates/maintains tables in data repository, specifies data mapping from source-to-target tables, develops ETL processing capabilities |
| Operator | Can manually run ETL jobs, view ETL processing reports and statistics |

Table 27: JRules User Roles and Privileges

| Role | Privileges |
| --- | --- |
| Administrator | Full administrative rights on Decision Center, including the ability to define users and permissions  Plus all Reviewer capabilities |
| Reviewer | Able to review rules with status “Defined” and either approve them by assigning a status of “Validated”, reject them by assigning a status of “Rejected”, or launch them by assigning a status of “Deployable”.  Plus all Author capabilities. |
| Author | Able to author and modify business rules and assign a status of “Defined” to rules.  Plus all Viewer capabilities. |
| Viewer | Able to browse and view defined rules and schemes  (Note: the VA Claims Clerk will continue to use existing VA source systems to see claim line scores) |

Table 28: FAMS User Roles and Privileges

| **Role** | **Privileges** |
| --- | --- |
| Administrator | In addition to the functionality of the Power User Role, the Administrator Role grants users full administrative rights to the FAMS application. FAMS Administrators can: Administer security Load and maintain claim database tables (with the partnership of the individual maintaining the PIT Data Repository, as needed) Provide database-specific support Define and create Auto-Extract Processes for Service Level Files Administer the databases Update database tables Perform application data mapping to support the Auto-Extract process and feature selection Post-installation validation Participate in Defining Peer Group and Models |
| Power User | In addition to the functionality of the Business User Role, the Power User Role allows users to run the Profile Baseline Processes including Service-Level Extract (SLE), Value Set generation and Profiling.  Power Users can: Assist with documenting/defining business processes for selecting cases using FAMS Participate in installation Perform production testing Assist business users with selecting peer groups for review Define filters that FAMS administrators should apply to profiles Generate SLE extraction of claims from the Data Mart Generate Feature Values (answers to the questions in the scoring model) Profile data, apply Hypothesis Modules, and provide values and scores for Business Users Identify entities for review and take notes on rosters |
| Business Analysis User | Create behavior models Define and document custom report requirements Perform production testing Leverage the visualization, data discovery, and reporting capabilities within FAMS to identify outliers Create case notes and rosters within FAMS, and assign cases for business use Review case information selected by FAMS Power Users Leverage FAMS reports to confirm allegations Print/store all reports required for case creation |

#### Dependencies and Constraints

The PC-PIE project team, software, and test servers will adhere to the following directives, policies, procedures, standards, and guidelines:

* Program Management Accountability System (PMAS) and ProPath guidelines and processes
* Section 508 Information Technology (IT) accessibility standards governed under 29 U.S.C 794d
* Health Insurance Portability and Accountability Act (HIPAA)
* VA DIRECTIVE 6508 - Privacy Impact Assessments
* VA Directive 6500 – Information Security Program
* OneVA Technical Reference Model (TRM)

### Specific Requirements

#### Database Repository

This section will be updated when the software developer has been identified and has begun development agile sprint cycles

#### System Features

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

#### Design Element Tables

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Routines (Entry Points)

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 29: (Grouping): Routines

| Routines | Activities | | | |
| --- | --- | --- | --- | --- |
| Routine Name | TBD | | | |
| Enhancement Category | New | Modify | Delete | No Change |
| RTM | TBD | | | |
| Related Options | TBD | | | |

| Related Routines | Routines “Called By” | Routines “Called” |
| --- | --- | --- |
|  | TBD | TBD |

| Routines | Activities | | | | |
| --- | --- | --- | --- | --- | --- |
| Data Dictionary (DD) References | TBD | | | | |
| Related Protocols | TBD | | | | |
| Related Integration Control Registrations (ICRs) | TBD | | | | |
| Data Passing | Input | Output Reference | Both | Global Reference | Local |
| Input Attribute Name and Definition | Name: TBD  Definition:TBD | | | | |
| Output Attribute Name and Definition | Name:TBD  Definition: TBD | | | | |

| Current Logic |
| --- |
| TBD |

| Modified Logic (Changes are in bold) |
| --- |
| TBD |

##### Templates

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Bulletins

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 30: Bulletins

| Bulletins | Description | | | |
| --- | --- | --- | --- | --- |
| Bulletin Name | TBD | | | |
| Enhancement Category | New | Modify | Delete | No Change |
| RTM | TBD | | | |

| Related Routines | Routines “Called By” | Routines “Called” |
| --- | --- | --- |
|  | TBD | TBD |

| Routines | Description |
| --- | --- |
| Mail Subject | TBD |
| Mail Group | TBD |
| Parameters | TBD |
| Data Dictionary (DD) References | TBD |

##### Data Entries Affected by the Design

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 31: Data Entries Affected by the Design

| Field Name | Current Value | New Value |
| --- | --- | --- |
| TBD | TBD | TBD |

##### Unique Record(s)

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 32: Unique Record ID

| Field Name(s) | Current Value | New Value |
| --- | --- | --- |
| TBD | TBD | TBD |

##### File or Global Size Changes

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 33: File or Global Size Changes

| File/Global Name(s) | Estimated Increase | Estimated Decrease |
| --- | --- | --- |
| TBD | TBD | TBD |

##### Mail Groups

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 34: Mail Groups

| Mail Groups | Activities | | | |
| --- | --- | --- | --- | --- |
| Mail Group Name | TBD | | | |
| Enhancement Category | New | Modify | Delete | No Change |
| Related Options |  | | | |

| Related Routines | Routines “Called By” | Routines “Called” |
| --- | --- | --- |
|  | TBD | TBD |

| Mail Groups | Instructions | |
| --- | --- | --- |
| Data Dictionary (DD) References | TBD | |
| Related Protocols | TBD | |
| Mail Group Description | TBD | |
| Self-Enrollment Allowed | Yes | No |
| Type | Public | Private |

##### Security Keys

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 35: Security Keys

| Security Keys | Activities | | | |
| --- | --- | --- | --- | --- |
| Security Key Name | TBD | | | |
| Enhancement Category | New | Modify | Delete | No Change |
| Related Options | TBD | | | |

| Related Routines | Routines “Called By” | Routines “Called” |
| --- | --- | --- |
|  | TBD | TBD |

| Security Keys | Activities | | | | |
| --- | --- | --- | --- | --- | --- |
| Data Passing | Input | Output | Both | Global Reference | Local Reference |
| Security Key Description | TBD | | | | |
| Subordinate Keys | TBD | | | | |
| Mutually Exclusive Keys | TBD | | | | |
| Granting Condition Logic | TBD | | | | |

| Current Logic |
| --- |
| TBD |

| Modified Logic (Changes are in bold) |
| --- |
| TBD |

| Security Keys | Activities |
| --- | --- |
| Hierarchical Precedence | TBD |

##### Options

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 36: Options

| Options | Activities | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Option Name | TBD | | | | | | | | | | |
| Enhancement Category | New | Modify | | | | Delete | | | No Change | | |
| Associated Menu Options that will invoke this reference | TBD | | | | | | | | | | |
| Data Passing | Input | | Output | | Both | | | Global Reference | | | Local Reference |
| Menu Text Description |  | | | | | | | | | | |
| Option Type | Edit | | | Print | | | Menu | | | Inquire | |
| Action | | | Run Routine | | | Other | | |  | |
| Associated Routine | TBD | | | | | | | | | | |
| Option Definition | TBD | | | | | | | | | | |

| Current Entry Action Logic |
| --- |
| TBD |

| Modified Entry Action Logic (Changes are in bold) |
| --- |
| TBD |

| Current Exit Action Logic |
| --- |
| TBD |

| Modified Exit Action Logic (Changes are in bold) |
| --- |
| TBD |

##### Protocols

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 37: Protocols

| Protocols | Activities |
| --- | --- |
| Protocol Name | TBD |
| Enhancement Category | New  Modify  Delete  No Change |
| Associated Protocols | TBD |
| Data Passing | Input  Output  Both  Global Reference  Local Reference |
| Item Text Description |  |
| Protocol Type | Action  Menu  Protocol  Protocol Menu  Limited Protocol  Extended Action  Dialog  Other |
| Associated Routine | TBD |

| Current Entry Action Logic |
| --- |
| TBD |

| Modified Entry Action Logic (Changes are in bold) |
| --- |
| TBD |

| Current Exit Action Logic |
| --- |
| TBD |

| Modified Exit Action Logic (Changes are in bold) |
| --- |
| TBD |

##### Remote Procedure Call (RPC)

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 38: RPCs

| RPCs | Activities | | |
| --- | --- | --- | --- |
| Name | TBD | | |
| TAG^RTN | TBD | | |
| Input Parameters | TBD | | |
| Results Array | Single Value | Array | Word Processing |
| Global Array | Global Instance |  |
| Description | TBD | | |

##### Constants Defined in Interface

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 39: Constants Defined in Interface

| Name | Description |
| --- | --- |
| TBD | TBD |

##### Variables Defined in Interface

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 40: Variables Defined in Interface

| Name | Type | Description |
| --- | --- | --- |
| TBD | TBD | TBD |

##### Types Defined in Interface

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 41: Types Defined in Interface

| Name | Type | Description |
| --- | --- | --- |
| TBD | TBD | TBD |

##### GUI

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 42: GUI

| Unit Name | Description |
| --- | --- |
| TBD | TBD |

##### GUI Classes

Table 43: GUI Classes

| GUI Classes | Instructions |
| --- | --- |
| Class Name | TBD |
| Derived From Class | TBD |
| Purpose | TBD |

##### Current Form

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Modified Form

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Components on Form

Table 44: Components on Form

| Name | Type | Description |
| --- | --- | --- |
| TBD | TBD | TBD |

##### Events

Table 45: Events

| Name | Type | Description |
| --- | --- | --- |
| TBD | TBD | TBD |

##### Methods

Table 46: Methods

| Method Name | Procedure/Function | Description |
| --- | --- | --- |
| TBD | TBD | TBD |

##### Special References

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 47: Special Reference

| Special Reference Name | Type | Description |
| --- | --- | --- |
| TBD | TBD | TBD |

##### Class Events

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 48: Class Events

| Name | Type | Description |
| --- | --- | --- |
| TBD | TBD | TBD |

##### Class Methods

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 49: Class Methods

| Name | Procedure/Function | Description |
| --- | --- | --- |
| TBD | TBD | TBD |

##### Class Properties

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 50: Class Properties

| Class Properties Name | Type | Visibility | Description |
| --- | --- | --- | --- |
| TBD | TBD | TBD | TBD |

##### Uses Clause

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Forms

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 51: Forms (Grouping)

| Forms | Description | | | |
| --- | --- | --- | --- | --- |
| Form Name | TBD | | | |
| Enhancement Category | New | Modify | Delete | No Change |
| Form Functionality |  | | | |

| Current Form Layout |
| --- |
|  |

| Modified Form Layout (Changes are in bold) |
| --- |
|  |

##### Functions

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 52: Forms (Grouping)

| Function Name | Activities | | | |
| --- | --- | --- | --- | --- |
| Short Description | TBD | | | |
| Enhancement Category | New | Modify | Delete | No Change |
| Related Options | TBD | | | |

| Related Routines | Routines “Called By” | Routines “Called” |
| --- | --- | --- |
|  |  |  |

| Function Name | Activities | | | | |
| --- | --- | --- | --- | --- | --- |
| Data Dictionary (DD) References |  | | | | |
| Related Protocols |  | | | | |
| Related Integration Control Registrations (ICRs) |  | | | | |
| Data Passing | Input | Output | Both | Global Reference | Local Reference |
| Input Attribute Name and Definition | Name: | | | | |
| Definition: | | | | |
| Output Attribute Name and Definition | Name: | | | | |
| Definition: | | | | |

| Current Logic |
| --- |
|  |

| Modified Logic (Changes are in bold) |
| --- |
|  |

##### Dialog

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 53: Dialog (Instructions)

| Dialog | Instructions | | | |
| --- | --- | --- | --- | --- |
| Dialog Message (Description) | TBD | | | |
| Enhancement Category | New | Modify | Delete | No Change |
| Dialog Message (Description) Condition | TBD | | | |
| Current Dialog Message (Description) | TBD | | | |
| Modified Dialog Message (Description)  (Changes are in bold) | TBD | | | |

##### Help Frame

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 54: Help Frame

| Help Frame | Description | | | |
| --- | --- | --- | --- | --- |
| Help Frame Text | TBD | | | |
| Enhancement Category | New | Modify | Delete | No Change |
| Help Frame Text Calling Mechanism | TBD | | | |

| Current Help Frame Text |
| --- |
| TBD |

| Modified Help Frame Text (Changes are in bold) |
| --- |
| TBD |

##### HL7 Application Parameter

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 55: HL7 Application Parameter

| HL7 Application Parameter Name | Description |
| --- | --- |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Enhancement Category | New | Modify | Delete | No Change |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Application Status | Active | Inactive | Active | Inactive |

| Enhancement Category | Current | Modified |
| --- | --- | --- |
| Facility Name | TBD | TBD |
| Country Code | TBD | TBD |
| HL7 Field Separator | TBD | TBD |
| HL7 Encoding Characters | TBD | TBD |
| Mail Group | TBD | TBD |

##### HL7 Logical Link

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 56: HL7 Logical Link

| HL7 Logical Link | Description |
| --- | --- |
| HL7 Logical Link Parameter Name | TBD |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Enhancement Category | New | Modify | Delete | No Change |

| Enhancement Category | Current | Modified |
| --- | --- | --- |
| Node | TBD | TBD |
| Institution | TBD | TBD |
| Domain | TBD | TBD |
| Autostart | TBD | TBD |
| Queue Size | TBD | TBD |
| LLP Type | TBD | TBD |

##### COTS Interface

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 57: COTS Interface

| COTS Interface | Description |
| --- | --- |
| Communication Method | TBD |
| Application Interface | TBD |

## Network Detailed Design

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

## Security and Privacy

### Security

In accordance with the Federal Information Processing Standard 199 (FIPS 199) analysis, the Security Categorization for the Purchased Care - Program Integrity Enhancements (PC-PIE) is ***Moderate***. The Security Categorization will drive the initial set of minimal security controls required for the information system. Minimum security control requirements are addressed in NIST SP 800-53 and VA Handbook 6500, Appendix F. All VA security requirements as defined in VA Handbook 6500 Appendix F will be adhered to.

VA Common Security Controls are documented in [VA Handbook 6500 Appendix F, attachment-1](http://www.domain/vapubs/viewPublication.asp?Pub_ID=793&FType=2) Common Controls are applicable to all Office of Information and Technology (OI&T) systems and are the responsibility of OI&T management for implementation and management.

VA Hybrid Security Controls are documented in VA Handbook 6500 Appendix F, attachment-2. Hybrid Security Controls can be defined as part common control and part system-specific control. The implementation of these controls is the responsibility of the field either at the national, regional or at the facility system level.

VA System-Specific Security Controls are documented in VA Handbook 6500 Appendix F, attachment-3. Applicable system-specific controls should be determined by the Information System Owner, using the recommended values provided in VA Handbook 6500 Appendix F, attachment-3. System-specific controls may be tailored to meet the unique specifications and environment of the system as determined by the Information System Owner.

The PC-PIE Requirement Specification Document (RSD) section 2.12 documents the Security Specifications, as well as business specific security requirements. Table 7 of the PC-PIE RSD lists applicable security controls.

### Privacy

The PC-PIE Requirement Specification Document (RSD) section 2.12 documents the Privacy and Security Specifications, as well as business specific privacy requirements. Table 7 of the PC-PIE RSD lists applicable HIPAA Privacy and Security control requirements in accordance with [VA Handbook 6500 Appendix E](http://www.domain/vapubs/viewPublication.asp?Pub_ID=793&FType=2). The VHA Health Care Security Requirements (HCSR) will determine applicable HIPAA security requirements for the PC-PIE project.

## Service Oriented Architecture / ESS Detailed Design

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

### Service Description for <Consumed Service Name>

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

### Service Design for <Provided Service Name>

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

#### Introduction

##### Purpose and Scope of Service

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Links to Other Documents

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

#### Service Details

##### Service Identification

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 58: Service Attribute and Value

| Service Attribute | Value |
| --- | --- |
| Name and Alias (if any) | TBD. |
| Overview | TBD. |
| Version | TBD. |
| Latest Status | TBD. |
| Service Type | TBD. |
| Architecture Layer | TBD. |
| Business Domain | TBD. |
| Service Domain | TBD. |
| Business Organization and Owner | TBD. |
| Technical Organization and Owner | TBD. |
| Development Organization and Owner | TBD. |
| Support Organization and Owner | TBD. |
| Target Consumer Organization(s) and Owner(s) | TBD. |

##### Service Versions

Table 59: Service Versions

|  |  |  |
| --- | --- | --- |
| Version Numbers | Current Status of Version | A Brief Description of the change implemented in that version |
| TBD. | TBD. | TBD. |
| TBD. | TBD. | TBD. |
| TBD. | TBD. | TBD. |

##### Summary of Design and Platform Details

###### SOA Pattern(s) Implemented

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### COTS Platform vendor names and versions for hosting platform

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

#### Dependencies

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

#### Service Design Details

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Interface Technical Specs

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### Service Invocation Type

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### Service Interface Type

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### Service Name

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### Interface

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### End Points

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### Operations or Methods

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 60: Operations or Methods

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Operation Name | Inputs | Outputs | Transactional Qualities, if relevant (Updating?, Atomic?, Can participate in transaction?) | Pre and Post Conditions | Exception (s) |
| TBD | TBD | TBD | TBD | TBD | TBD |
| TBD | TBD | TBD | TBD | TBD | TBD |

###### Message Schemas

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Information Model

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### Class Diagram and Description of Entities Involved

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### Mappings from ELDM to Standards Based Schemas

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Behavior Model (AKA Use Case Realization)

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### Use Cases (Use Case Model)

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

###### Interaction Diagrams

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

#### Gap Analysis

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

Table 61: Gap Analysis

| Design Elements🡪  Policies / SLD elements etc.↓ | Design  Element A | Design  Element B | Design  Element C | Comment for non-conformance |
| --- | --- | --- | --- | --- |
| TBD | TBD | TBD | TBD | TBD |
| TBD | TBD | TBD | TBD | TBD |
| TBD | TBD | TBD | TBD | TBD |
| TBD | TBD | TBD | TBD | TBD |
| TBD | TBD | TBD | TBD | TBD |

##### Variances from Enterprise Target Architecture

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Variances from SLDs

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Variances from Standards and Policies

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

##### Justification for Exceptions and Mitigation

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

# External System Interface Design

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

## Interface Architecture

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

## Interface Detailed Design

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

# Human-Machine Interface

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

## Interface Design Rules

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

## Inputs

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

## Outputs

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

## Navigation Hierarchy

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

### Screen [x.1]

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

### Screen [x.2]

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

### Screen [x.3]

This section will be updated when the software developer has been identified and has begun development agile sprint cycles.

# Attachment A – Approval Signatures

This section is used to document the approval of the System Design Document. The review should be conducted face to face where signatures can be obtained ‘live’ during the review. If unable to conduct a face-to-face meeting then it should be held via LiveMeeting and concurrence captured during the meeting. The Scribe should add /es/ name by each position cited.

The Business Sponsor and Project Manager are required to sign.

Signed:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

, Business Systems Management (BSM) Project Manager Date

Integrated Project Team (IPT) Co-Chair

Signed:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

, Product Development (PD) Project Manager Date

IPT Co-Chair

Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

, Business Sponsor Date

Program Integrity Director

Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

, Business Sponsor Date

BSM Deputy Director

Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

, IT Program Manager Date

1. Additional Information
   1. Identification of Technology and Standards

There are two Core Common Business and Infrastructure Standards which have been published, the Release Architecture and Identity and Access Management. The Program Integrity Tools adheres to the Enterprise Technical Architecture Compliance Guidance, signed August 2012, and aligns with the OneVA EA Global Principles, including: Mission Alignment, Data Visibility and Accessibility, Data Interoperability, Infrastructure Interoperability, Information Security, Enterprise Services.

* 1. Constraining Policies, Directives and Procedures

The PC-PIE project team, software, and test servers will adhere to the following directives, policies, procedures, standards, and guidelines:

* Program Management Accountability System (PMAS) and ProPath guidelines and processes
* Section 508 Information Technology (IT) accessibility standards governed under 29 U.S.C 794d
* VA Directive 6513 – VA Network Infrastructure
* VA Handbook 6500.3 – Certification & Accreditation Requirements

Claims and Clinical data fetched from the source systems may contain Protected Health Information (PHI) and Electronic Protected Health Information (EPHI) that is subject to protection under the regulations issued by the Department of Health and Human Services, as mandated by the Health Insurance Portability and Accountability Act of 1996 (HIPAA); 45 CFR Parts 160 and 164, Subparts A and E, the Standards for Privacy of Individually Identifiable Health Information (“Privacy Rule”); and 45 CFR Parts 160 and 164, Subparts A and C, the Security Standard (“Security Rule”). Pursuant to the Privacy and Security Rules, the system shall be architected to protect PHI and EPHI.

* 1. Requirements Traceability Matrix

The Requirements Traceability Matrix (RTM) for the PC-PIE project can be accessed by using the link provided below:

* [PC-PIE RTM](https://vaww.server1.domain/sites/cbopc/BSM/PIE/default.aspx)
  1. Packaging and Installation

The prerequisites, preparation and installation steps for the IBM InfoSphere DataStage and Solution Scalability is outline in the Non-VA Care Program Integrity Tools-Comprehensive Server User Manual Volume I.

The prerequisites, preparation and installation steps for the Claims Scoring Tool is outline in the Non-VA Care Program Integrity Tools-Comprehensive Server User Manual Volume II.

* 1. Design Metrics

TBD

* 1. Glossary of Terms

Table 62: Glossary of Terms

| Term | Meaning |
| --- | --- |
| ACR | Artifact Central Repository |
| AITC | Austin Information Technology Center |
| BI | Business Intelligence |
| BRD | Business Requirements Document |
| C&A | Certification and Accreditation |
| CBO | Chief Business Office |
| CHAMPVA | Civilian Health and Medical Program of the VA |
| CDW | Corporate Data Warehouse |
| CLRA | Claim Line Risk Assessment |
| COTS | Commercial Off-The-Shelf |
| CP&E | Claim Processing and Eligibility System |
| DBMS | Database Management System |
| EDI | Electronic Data Interchange |
| ETL | Extract, Transform and Load |
| FAMS | Fraud and Abuse Management System |
| FBCS | Fee Basis Claims Software |
| FWA | Fraud/Waste/Abuse |
| HAC | Health Administration Center |
| HCE | Health Care Efficiency |
| HCP | Heath Claims Processing |
| HIPAA | Health Insurance Portability and Accountability Act of 1996 |
| ICD-9 | International Classification of Diseases Version 9 |
| ICD-10 | International Classification of Diseases Version 10 |
| IPERA | **Improper Payments Elimination and Recovery Act** |
| IT | Information Technology |
| IM/IT | Information Management/Information Technology |
| MOSS | Microsoft Office SharePoint Server |
| MS | Microsoft |
| NCPDP | National Council for Prescription Drug Programs |
| OIT | Office of Information & Technology |
| PCBL | Purchased Care Business Line |
| PD | Product Development |
| PHI | Protected Health Information |
| PII | Personally Identifiable Information |
| PIT | Program Integrity Tools |
| PITEDR | Program Integrity Tools Enterprise Data Repository |
| PMAS | Project Management Accountability System |
| PMP | Program Management Plan |
| RDBMS | Relational Database Management System |
| RSD | Requirement Specification Document |
| SAS | Statistical Analysis System Institute |
| SDD | System Design Document |
| SQL | Structured Query Language |
| VA | Department of Veterans Affairs |
| VAMC | Veterans Affairs Medical Center |
| VHA | Veterans Health Administration |
| VISN | Veterans Integrated Service Network |
| VistA | Veterans Health Information Systems and Technology Architecture |
| WBE | WebSphere Business Events |

Template Revision History

| Date | Version | Description | Author |
| --- | --- | --- | --- |
| June 2015 | 2.10 | Changed Heading 1 default setting to eliminate page break before | Process Management |
| May 2015 | 2.9 | Edited for Section 508 conformance and remediated with Common Look Office tool | Process Management |
| February 2015 | 2.8 | Incorporates revisions from PMAS Reform Lockdown; namely removing requirements for information that can be obtained from other PMAS authoritative sources. | , Office of Technology Strategies |
| September 2014 | 2.7 | Adds Enterprise Shared Services terms and requires AERB Compliance Certificate attachment. | Process Management |
| August 2014 | 2.6 | Signature block update authorized by AERB CR\_018934 | Process Management |
| March 2014 | 2.5 | Section 508 repairs to new version approved by AERB Chair approved | Process Management |
| August 2013 | 2.3 | Replaced the Service Architecture sub-section with new sub-sections for consumed and provided services. Also applied miscellaneous feedback from VA team. | ASD Enterprise Shared Services (ESS) Work Group |
| June 2013 | 1.3 | Upgraded to MS Office 2007-2010 format | Process Management |
| June 2013 | 1.2 | Address inconsistencies in Section 3, Conceptual Design, Correct headings | Process Management |
| March 2013 | 1.1 | Formatted to documentation standards and edited for Section 508 conformance | Process Management |
| January 2013 | 1.0 | Initial Document | PMAS Business Office |

See TOGAF® 9.1, Part III: ADM Guidelines & Techniques, Gap Analysis on TOGAF website at <http://pubs.opengroup.org/architecture/togaf9-doc/arch/chap27.html>